Query 1

Top 10 Customers with Failed Logins (Last 7 Days).

```
mysql> SELECT
    ->      cd.party_id,
    ->      cd.phone_number,
    ->      COUNT(*) AS failed_logins
    -> FROM
    ->      customer_data cd
    -> JOIN
    ->      login_instance_data lid ON cd.party_id = lid.party_id
    -> WHERE
    ->      lid.successful = FALSE
    ->      AND lid.timestamp >= CURRENT_DATE - INTERVAL 7 DAY
    -> GROUP BY
    ->      cd.party_id, cd.phone_number
    -> ORDER BY
    ->      failed_logins DESC
    -> LIMIT 10;
+----------+------------------------+---------------+
| party_id | phone_number           | failed_logins |
+----------+------------------------+---------------+
|   654523 | 001-660-812-7055       |             1 |
|   223412 | 910-639-0985x2741      |             1 |
|   279414 | (402)871-4283x9752     |             1 |
|   435649 | 001-666-223-7582x57173 |             1 |
|   289061 | (768)821-8083x165      |             1 |
|   142347 | 662.238.2923           |             1 |
|   426751 | (352)203-5192x303      |             1 |
|   959182 | 001-732-358-3861x269   |             1 |
|   284063 | 400.535.1056           |             1 |
|   363028 | 522-294-5682x417       |             1 |
+----------+------------------------+---------------+
10 rows in set (0.01 sec)
```

Query 2

List all customers with more than 1 account and show their party ID and number of accounts.

```
mysql> SELECT
    ->      cad.party_id,
    ->      COUNT(DISTINCT cad.account_id) AS num_accounts
    -> FROM
    ->      customer_account_data cad
    -> GROUP BY
```

```
    ->      cad.party_id
    -> HAVING
    ->      COUNT(DISTINCT cad.account_id) > 1
    -> ORDER BY
    ->      num_accounts DESC;
+----------+--------------+
| party_id | num_accounts |
+----------+--------------+
|   918807 |            8 |
|   354993 |            7 |
|   517213 |            7 |
|   899690 |            7 |
|   204417 |            6 |
|   435649 |            6 |
|   553606 |            6 |
|   630171 |            6 |
|   784246 |            6 |
|   846102 |            6 |
|   124876 |            5 |
|   142537 |            5 |
|   145270 |            5 |
|   178476 |            5 |
|   278362 |            5 |
|   339643 |            5 |
|   353168 |            5 |
|   405144 |            5 |
|   489089 |            5 |
|   510987 |            5 |
|   736402 |            5 |
|   768390 |            5 |
|   841384 |            5 |
|   912674 |            5 |
|   161769 |            4 |
|   165878 |            4 |
|   176588 |            4 |
|   185131 |            4 |
|   211347 |            4 |
|   267355 |            4 |
|   285598 |            4 |
|   307937 |            4 |
|   374452 |            4 |
|   482841 |            4 |
|   496323 |            4 |
|   524726 |            4 |
|   550379 |            4 |
|   576134 |            4 |
|   627699 |            4 |
|   642667 |            4 |
```

690831	4
702347	4
703047	4
707848	4
766398	4
823236	4
831142	4
848469	4
870797	4
891092	4
918904	4
932942	4
933473	4
942532	4
957476	4
957570	4
120373	3
136888	3
142347	3
152017	3
173743	3
183720	3
192141	3
221412	3
222328	3
225009	3
245284	3
263426	3
265756	3
273148	3
279414	3
284063	3
328815	3
381705	3
385804	3
426751	3
437427	3
455782	3
467418	3
510757	3
531846	3
542389	3
544683	3
545031	3
560657	3
638387	3
654523	3
693875	3

695822	3
730556	3
753483	3
764417	3
791592	3
796365	3
802344	3
806515	3
857288	3
860481	3
882208	3
927372	3
968810	3
107171	2
118675	2
127697	2
137895	2
140937	2
156059	2
166701	2
183571	2
191947	2
192453	2
206328	2
210200	2
231918	2
239917	2
246651	2
278745	2
289061	2
298585	2
302361	2
332361	2
342889	2
351676	2
360610	2
363028	2
369304	2
394899	2
397949	2
434982	2
442950	2
454854	2
464362	2
492904	2
498067	2
512461	2
555576	2

```
|    568764 |              2 |
|    608483 |              2 |
|    627694 |              2 |
|    633917 |              2 |
|    640867 |              2 |
|    647640 |              2 |
|    656919 |              2 |
|    681576 |              2 |
|    684170 |              2 |
|    721692 |              2 |
|    731213 |              2 |
|    750586 |              2 |
|    756916 |              2 |
|    757216 |              2 |
|    770348 |              2 |
|    794486 |              2 |
|    809235 |              2 |
|    832368 |              2 |
|    861689 |              2 |
|    862525 |              2 |
|    865307 |              2 |
|    873824 |              2 |
|    874299 |              2 |
|    882939 |              2 |
|    883545 |              2 |
|    912442 |              2 |
|    918605 |              2 |
|    921884 |              2 |
|    924197 |              2 |
|    959182 |              2 |
|    960168 |              2 |
|    978433 |              2 |
+----------+--------------+
168 rows in set (0.07 sec)
```

Query 3

List accounts with **more than 5 failed login attempts in the last 24 hours**, including the **account ID**, **number of failed attempts**, and the **most recent timestamp** of those failures.

```
mysql> SELECT
    ->     cad.account_id,
    ->     COUNT(*) AS failed_attempts,
    ->     MAX(lid.timestamp) AS last_failed_attempt
```

```
    -> FROM
    ->     login_instance_data lid
    -> JOIN
    ->     customer_account_data cad ON lid.party_id = cad.party_id
    -> WHERE
    ->     lid.successful = FALSE
    ->     AND lid.timestamp >= NOW() - INTERVAL 1 DAY
    -> GROUP BY
    ->     cad.account_id
    -> HAVING
    ->     failed_attempts > 5
    -> ORDER BY
    ->     failed_attempts DESC;
Empty set (0.02 sec)
```

In the past 24 hours, no account had more than 5 failed login attempts.

Query 4

Find Customers Who Accessed Multiple Accounts in the Same Day.

```
mysql> SELECT
    ->     li.party_id,
    ->     DATE(li.timestamp) AS access_date,
    ->     COUNT(DISTINCT ca.account_id) AS distinct_accounts_accessed
    -> FROM
    ->     login_instance_data li
    -> JOIN
    ->     customer_account_data ca ON li.party_id = ca.party_id
    -> WHERE
    ->     li.timestamp IS NOT NULL
    -> GROUP BY
    ->     li.party_id, DATE(li.timestamp)
    -> HAVING
    ->     COUNT(DISTINCT ca.account_id) > 1;
+----------+-------------+----------------------------+
| party_id | access_date | distinct_accounts_accessed |
+----------+-------------+----------------------------+
|   118675 | 2025-07-26  |                          2 |
|   120373 | 2025-07-26  |                          3 |
|   124876 | 2025-07-26  |                          5 |
|   127697 | 2025-07-26  |                          2 |
|   136888 | 2025-07-26  |                          3 |
|   137895 | 2025-07-26  |                          2 |
|   140937 | 2025-07-26  |                          2 |
|   142347 | 2025-07-26  |                          3 |
```

142537	2025-07-26	5
145270	2025-07-26	5
152017	2025-07-26	3
156059	2025-07-26	2
166701	2025-07-26	2
173743	2025-07-26	3
176588	2025-07-26	4
178476	2025-07-26	5
183720	2025-07-26	3
191947	2025-07-26	2
192141	2025-07-26	3
192453	2025-07-26	2
204417	2025-07-26	6
206328	2025-07-26	2
210200	2025-07-26	2
222328	2025-07-26	3
225009	2025-07-26	3
263426	2025-07-26	3
265756	2025-07-26	3
267355	2025-07-26	4
273148	2025-07-26	3
278362	2025-07-26	5
278745	2025-07-26	2
279414	2025-07-26	3
284063	2025-07-26	3
285598	2025-07-26	4
289061	2025-07-26	2
298585	2025-07-26	2
307937	2025-07-26	4
328815	2025-07-26	3
339643	2025-07-26	5
342889	2025-07-26	2
351676	2025-07-26	2
353168	2025-07-26	5
354993	2025-07-26	7
363028	2025-07-26	2
381705	2025-07-26	3
385804	2025-07-26	3
394899	2025-07-26	2
397949	2025-07-26	2
405144	2025-07-26	5
426751	2025-07-26	3
435649	2025-07-26	6
437427	2025-07-26	3
455782	2025-07-26	3
464362	2025-07-26	2
467418	2025-07-26	3
482841	2025-07-26	4

489089	2025-07-26		5
492904	2025-07-26		2
496323	2025-07-26		4
498067	2025-07-26		2
510757	2025-07-26		3
510987	2025-07-26		5
517213	2025-07-26		7
524726	2025-07-26		4
553606	2025-07-26		6
555576	2025-07-26		2
568764	2025-07-26		2
608483	2025-07-26		2
627694	2025-07-26		2
630171	2025-07-26		6
638387	2025-07-26		3
640867	2025-07-26		2
647640	2025-07-26		2
654523	2025-07-26		3
656919	2025-07-26		2
681576	2025-07-26		2
684170	2025-07-26		2
690831	2025-07-26		4
693875	2025-07-26		3
695822	2025-07-26		3
702347	2025-07-26		4
703047	2025-07-26		4
721692	2025-07-26		2
730556	2025-07-26		3
731213	2025-07-26		2
750586	2025-07-26		2
753483	2025-07-26		3
756916	2025-07-26		2
757216	2025-07-26		2
764417	2025-07-26		3
766398	2025-07-26		4
768390	2025-07-26		5
770348	2025-07-26		2
784246	2025-07-26		6
794486	2025-07-26		2
796365	2025-07-26		3
802344	2025-07-26		3
806515	2025-07-26		3
823236	2025-07-26		4
832368	2025-07-26		2
846102	2025-07-26		6
848469	2025-07-26		4
860481	2025-07-26		3
861689	2025-07-26		2

```
|    862525 | 2025-07-26  |                                        2 |
|    865307 | 2025-07-26  |                                        2 |
|    873824 | 2025-07-26  |                                        2 |
|    882208 | 2025-07-26  |                                        3 |
|    882939 | 2025-07-26  |                                        2 |
|    891092 | 2025-07-26  |                                        4 |
|    899690 | 2025-07-26  |                                        7 |
|    912442 | 2025-07-26  |                                        2 |
|    912674 | 2025-07-26  |                                        5 |
|    918605 | 2025-07-26  |                                        2 |
|    918807 | 2025-07-26  |                                        8 |
|    921884 | 2025-07-26  |                                        2 |
|    924197 | 2025-07-26  |                                        2 |
|    927372 | 2025-07-26  |                                        3 |
|    932942 | 2025-07-26  |                                        4 |
|    957476 | 2025-07-26  |                                        4 |
|    957570 | 2025-07-26  |                                        4 |
|    959182 | 2025-07-26  |                                        2 |
|    968810 | 2025-07-26  |                                        3 |
+----------+-------------+---------------------------+
123 rows in set (0.01 sec)
```

Query 5

Identify all devices used to access more than 3 distinct accounts in the last 7 days.

```
mysql> SELECT
    ->     lid.device_id,
    ->     COUNT(DISTINCT cad.account_id) AS distinct_accounts_accessed
    -> FROM
    ->     login_instance_data lid
    -> JOIN
    ->     customer_account_data cad ON lid.party_id = cad.party_id
    -> WHERE
    ->     lid.timestamp >= NOW() - INTERVAL 7 DAY
    -> GROUP BY
    ->     lid.device_id
    -> HAVING
    ->     COUNT(DISTINCT cad.account_id) > 3
    -> ORDER BY
    ->     distinct_accounts_accessed DESC;
+-----------+----------------------------+
| device_id | distinct_accounts_accessed |
+-----------+----------------------------+
|       807 |                         15 |
|       580 |                         12 |
|        77 |                         10 |
|       694 |                         10 |
```

	127		9
	617		9
	552		8
	716		8
	183		8
	317		7
	41		7
	979		7
	855		7
	672		7
	684		7
	682		7
	486		6
	679		6
	686		6
	657		6
	654		6
	641		6
	624		6
	622		6
	824		6
	90		6
	48		6
	549		6
	25		5
	713		5
	985		5
	946		5
	924		5
	577		5
	415		5
	907		5
	905		5
	404		5
	387		5
	116		5
	837		5
	808		5
	134		5
	786		5
	300		5
	239		5
	780		5
	167		5
	687		5
	719		5
	996		5
	700		4

```
|         697 |                              4 |
|         142 |                              4 |
|         163 |                              4 |
|         726 |                              4 |
|         730 |                              4 |
|         735 |                              4 |
|         753 |                              4 |
|         775 |                              4 |
|         220 |                              4 |
|         336 |                              4 |
|         789 |                              4 |
|         806 |                              4 |
|         371 |                              4 |
|         373 |                              4 |
|         128 |                              4 |
|         378 |                              4 |
|         631 |                              4 |
|         407 |                              4 |
|         591 |                              4 |
|         464 |                              4 |
|         481 |                              4 |
|          54 |                              4 |
|         524 |                              4 |
|         519 |                              4 |
+-----------+----------------------------+
76 rows in set (0.01 sec)
```

Query 6

Identify customers who accessed accounts from multiple locations within a short time frame (possible location fraud).

```
mysql> SELECT
    ->     lid.party_id,
    ->     COUNT(DISTINCT lid.location_id) AS location_count,
    ->     MIN(lid.timestamp) AS first_access,
    ->     MAX(lid.timestamp) AS last_access
    -> FROM
    ->     login_instance_data lid
    -> WHERE
    ->     lid.timestamp >= NOW() - INTERVAL 1 DAY
    -> GROUP BY
    ->     lid.party_id
    -> HAVING
    ->     location_count > 1
    ->     AND TIMESTAMPDIFF(MINUTE, first_access, last_access) <= 60
    -> ORDER BY
    ->     location_count DESC;
```

Empty set (0.01 sec)

Query 7

Which users (party_ids) have used suspicious or blacklisted devices?

```
mysql> SELECT DISTINCT ca.party_id
    -> FROM fraud_alert_data fa
    -> JOIN transaction_data td ON fa.transaction_id = td.transaction_id
    -> JOIN customer_account_data ca
    ->     ON td.payer_party_id = ca.party_id OR td.payee_party_id =
ca.party_id
    -> WHERE fa.status IN ('active', 'open');
+----------+
| party_id |
+----------+
|   204417 |
|   846102 |
|   768390 |
|   753483 |
|   124876 |
|   576134 |
|   957570 |
|   860481 |
|   912674 |
|   222328 |
|   630171 |
|   791592 |
|   107171 |
|   342889 |
|   550379 |
|   206328 |
|   707848 |
|   481010 |
|   957476 |
|   285598 |
|   681576 |
|   918904 |
|   844547 |
|   796365 |
|   426751 |
|   178476 |
|   405344 |
|   978433 |
|   647640 |
|   932942 |
|   781546 |
|   627699 |
```

```
|    703047 |
|    883545 |
|    633917 |
|    278450 |
|    118675 |
|    553606 |
|    702347 |
|    666258 |
|    339643 |
|    627694 |
|    498067 |
|    778853 |
|    394867 |
|    199234 |
|    278362 |
|    512461 |
|    464362 |
|    742541 |
|    490754 |
|    960168 |
|    912442 |
|    183571 |
|    882939 |
|    805775 |
|    136888 |
|    215560 |
|    101688 |
|    771452 |
|    239917 |
|    294470 |
|    631998 |
|    640867 |
|    724144 |
|    173743 |
|    183720 |
+----------+
67 rows in set (0.02 sec)
```

Query 8

Identify customers with multiple fraud alerts **and** aggregate their associated account IDs.

```
mysql> SELECT
    ->      ca.party_id,
    ->      GROUP_CONCAT(DISTINCT ca.account_id ORDER BY ca.account_id) AS
associated_accounts,
    ->      COUNT(*) AS fraud_alert_count
```

```
    -> FROM
    ->     fraud_alert_data fa
    -> JOIN
    ->     transaction_data td ON fa.transaction_id = td.transaction_id
    -> JOIN
    ->     customer_account_data ca
    ->     ON td.payer_party_id = ca.party_id OR td.payee_party_id =
ca.party_id
    -> WHERE
    ->     fa.status IN ('active', 'open')
    -> GROUP BY
    ->     ca.party_id
    -> HAVING
    ->     fraud_alert_count > 1
    -> ORDER BY
    ->     fraud_alert_count DESC;
```

party_id	associated_accounts	fraud_alert_count
339643	434192,439587,454042,803384,810076	15
912674	134418,301980,753542,775478,921702	15
204417	103455,209225,335617,676116,909219,917900	12
627699	319899,449855,486387,917900	12
553606	398815,496818,651296,814552,865749,983401	12
285598	193419,486843,577551,773130	12
124876	128177,402742,524893,589765,661642	10
178476	255450,418610,528434,765660,778104	10
278362	577551,630489,787629,839037,968187	10
702347	403768,539729,552808,875852	8
918904	194011,357794,441655,912935	8
342889	157413,331539	8
957570	130360,469941,937987,963228	8
550379	157413,199497,772671,844987	8
183720	839537,909219,968735	6
222328	135419,319899,417859	6
912442	595082,703768	6
753483	105664,379271,742983	6
630171	143337,150070,158937,346693,694316,803830	6
860481	133789,169303,499692	6
846102	103455,572143,810076,819692,878346,910494	6
768390	105623,563030,691281,776734,935975	5
703047	339006,578475,703768,983401	4
957476	186317,576199,756083,992438	4
576134	129912,209961,402742,676116	4
627694	466930,808644	4
633917	377488,697906	4
932942	309660,385695,420743,985821	4
647640	284955,310233	4

```
|   707848 | 162555,363039,394530,759248            |                4 |
|   796365 | 223894,311103,339006                   |                3 |
|   426751 | 242938,552808,844987                   |                3 |
|   136888 | 645680,660368,664564                   |                3 |
|   173743 | 831883,839537,849255                   |                3 |
|   791592 | 143337,558455,881090                   |                3 |
|   101688 | 653955                                 |                2 |
|   681576 | 194011,932674                          |                2 |
|   666258 | 417859                                 |                2 |
|   640867 | 742983,880530                          |                2 |
|   631998 | 726865                                 |                2 |
|   771452 | 695409                                 |                2 |
|   512461 | 582295,844987                          |                2 |
|   498067 | 509465,516758                          |                2 |
|   464362 | 585667,800194                          |                2 |
|   405344 | 273702                                 |                2 |
|   882939 | 602658,667944                          |                2 |
|   883545 | 355301,589068                          |                2 |
|   239917 | 703429,775199                          |                2 |
|   206328 | 160932,676116                          |                2 |
|   199234 | 576199                                 |                2 |
|   183571 | 602658,603961                          |                2 |
|   118675 | 385695,728729                          |                2 |
|   107171 | 156460,753542                          |                2 |
|   960168 | 589765,989490                          |                2 |
|   978433 | 277505,364235                          |                2 |
+----------+----------------------------------------+------------------+
55 rows in set (0.07 sec)
```